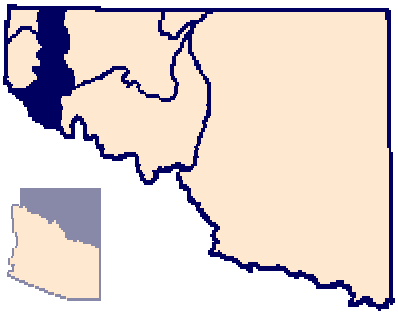
SHIVWITS PLATEAU BASIN



The Shivwits Plateau basin occupies 1,820 square miles in northwestern Arizona (Figure 10). Most of the basin falls in the Plateau uplands province. The Arizona-Utah state line is the basin's northern boundary, the Colorado River is the southern boundary, the Hurricane Cliffs are the eastern boundary, and the Grand Wash Cliffs and east flank of the Virgin Mountains are the basin's western boundary.

Most of the Shivwits Plateau basin is a high plateau with elevations of 4,000 to 6,000 feet above mean sea level. The lowest point in the basin is along the Colorado River at 1,220 feet above mean sea level.

The basin is composed of an alternating sequence of limestones, sandstones, and shales. Local faulting and erosion have carved mesas and canyons into these flat-lying sedimentary rocks. The Kaibab Limestone and Moenkopi Formation outcrop widely throughout the basin (Wilson and Moore, 1959). Alluvial sands and gravels occupy the larger washes and canyons in the basin.

Most groundwater is drawn from the alluvial sand and gravels along the larger washes. Wells that penetrate the consolidated sedimentary rocks provide minor amounts of water. A number of wells drilled into these sedimentary rocks have been dry holes, but the wells that do produce water have higher well yields than the alluvial wells. This indicates that well yields tapping the consolidated sedimentary formations are controlled by faults and fractures. Well depths range from 15 feet in the alluvium to 3,120 feet deep in the consolidated sedimentary rocks, and water levels vary from 10 feet to 908 feet below land surface (Arizona Department of Water Resources, 1991). Well yields generally are low, ranging from less than 10 gallons per minute to 45 gallons per minute (Levings and Farrar, 1979).

With less than 20 producing wells, groundwater development in the Shivwits Plateau basin is very slight. The U.S. Geological Survey estimated that groundwater withdrawals were less than 10 acre-feet per year in 1976 (Levings and Farrar, 1979). Stock and domestic wells account for all water use in the basin. The basin has no flowing rivers, and the washes only flow in response to rainfall and winter snowmelt. Infiltration of the rainfall and snowmelt is the sole source of recharge for the basin.

Water quality from wells generally is suitable for most domestic uses. Water from local springs and seeps tends to be of slightly better quality than the well water. Total dissolved solids concentrations of 1,100 milligrams per liter and high sulfate concentrations were reported from one well (Levings and Farrar, 1979).